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EXAMINER	
SURVILLO, OLEG	
ART UNIT	PAPER NUMBER
2442	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/816,102	JUNG ET AL.	
	Examiner	Art Unit	
	OLEG SURVILLO	2442	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 June 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *05/24/10*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission dated June 8, 2010 has been entered.

Response to Amendment

2. Claims 1-42 remain pending in the application. Claims 1, 13-18, 22-26, 31, 32, 34, and 37-42 are currently amended. No claims have been canceled. No new claims are added.

Response to Arguments

3. With regard to the applicant's remarks dated June 8, 2010:

regarding the rejection of claims 5, 13-25, 30, 33, and 36 under 35 U.S.C. 112, first paragraph, applicant's amendments have been fully considered but are insufficient to overcome the rejection. Therefore, the rejection is maintained.

As to claim 5, applicants state that support for "indexes comprising addresses of content stored in a memory" is found in the specification at least on page 11, last par.; and page 17 , first par. Examiner reviewed identified sections of the specification and found these sections completely unrelated to the argued limitation of "indexes comprising addresses of content stored in a memory". Therefore, the rejection is maintained.

As to claim 13, applicants state that support for "a device controlled by a second mote" is found in the specification at least on page 7, first full par. Examiner reviewed identified section of the specification and found this section completely unrelated to the argued limitation. In particular, none of light device 140, electrical/magnetic device 142, pressure device 144, temperature device 156, volume device 158, and inertial device 160, depicted at identified paragraph of the specification, are controlled by a mote to transmit an aggregate of mote-addressed content indexes, as claimed.

As to claims 25, 30, 33, and 36, examiner disagrees with applicants' conclusion that recitation of "transmitting content index that may contain content index from two differently addressed motes" in the specification suggests that "implicit in the content index is that the index excludes a content index from the mote that is transmitting". It appears that applicants rely on broad statements in the specification to argue claimed limitations that are narrower than what is actually described. Applicant's conclusory statements and speculation as to what the specification might implicitly suggest cannot take place of clear support or antecedent basis in the specification for the claimed subject matter.

Regarding the rejection of claims 39-42 under 35 U.S.C 112, second paragraph, applicant's amendment has been fully considered and is sufficient. Therefore, the rejection has been withdrawn.

Regarding the rejection of claims 1-42 under 35 U.S.C. 103(a), applicants' arguments have been fully considered.

It is noted that any arguments earlier presented were already fully addressed by the examiner in the last Office action. Since applicants failed to address examiner's remarks made in the last Office action, response to same arguments is not repeated here for brevity.

At point 1), applicants argue with respect to claim 1 at pages 25-28 of Remarks that *"Examiner has apparently not examined the recitations of Applicant's claims, but appears to have ignored the express language of Applicant's claims".* In response to this argument it is noted that all the recitations that were presented for the examination during the issuance of the last Office action were examined and thus the prima facie case of unpatentability has been established. Applicants cannot reasonably expect the examiner to examine the newly presented limitations prior to those claim amendments being entered in the record. Therefore, absence of the reasons for rejection for claim limitations that were not presented at the time when the last Office action was issued cannot justify "no prima facie case of unpatentability" argument presented by applicants.

At point 2), applicants argue with respect to claim 1 at pages 25-28 that *"Examiner has not yet explained how he would reach this mapping under the broadest reasonable interpretation framework as is Examiner's burden".* In response to this argument it is noted that Examiner's reasons for rejection of claim 1 along with mapping of each of claimed limitation to express language of the reference are fully sufficient for one of ordinary skill in the art to how each claimed limitation reads on the cited text of the reference. Thus, examiner's burden is satisfied. Applicants failed to provide statutes, regulations, or sections of the MPEP that would require examiner to provide any further explanation of how examiner reaches the mapping under the broadest reasonable interpretation framework beyond what has been already explained to applicants in the reasons for rejection, since applicants are expected to be of ordinary skill in the art.

At point 3), applicants argue with respect to claim 1 at pages 28-32 that *"Examiner has put forth no evidence supporting his characterization that Mulgund "teaches" recitations*

of Independent claim 1". In response this argument it is noted that argued "evidence" is clearly presented in the reasons for rejection in the form of paragraphs relied on in Mulgund reference. Applicants are reminded that the quoted material from Mulgund and/or Madden is not required to repeat the claim language word for word, as claimed limitations are a subject to interpretation, such interpretation being as broad as the claim terms would reasonably allow, in light of the specification, when read by one skilled in the art with which the claimed invention is most closely connected. Therefore, applicant's argument that *"the Examiner-identified portions of Mulgund do not recite the text of claim 1"* cannot be held as evidence of non-obviousness.

At point 4), applicants argue with respect to claim 1 at pages 32-33 that *"Examiner interpretation appears to be based on inadvertent impermissible hindsight, personal knowledge, or Official notice".* In response to this argument it is noted that applicants appear to confuse the issue of hindsight that is not permitted when combining references and providing reasons for "obviousness to combine" with claim interpretation. Applicants are requested to provide statutes, regulations, or sections of the MPEP that would prohibit claim interpretation through the lens of applicant's application. In fact, MPEP clearly instructs examiner to interpret the claims in light of the specification. See 37 CFR 1.75(d)(1). Applicants are further reminded that reliance on Official notice and/or personal knowledge in the Office action normally is accompanied by a statement to that effect. In the instance case, no such statement and/or reliance on Official notice and/or personal knowledge had been made. Therefore, applicant's request for an affidavit or declaration is denied.

At point 5), applicant's arguments with respect to claim 1 at pages 33-42 concerning teaching of Madden relied on in the rejection are not persuasive for analogous reasons as those discussed with respect to teachings of Mulgund at points 1-4.

At point 6), applicant argues with respect to claim 1 at pages 42-50 that *"the Examiner-suggested modifications/combinations to meet the recitations of independent claim 1 are mere conclusory statements without evidentiary support/change the principle of operation of components of cited references/render such components unfit for intended purpose"*. In response to this argument it is noted that teachings of Madden improve on the server-based approach of Mulgund by having aggregations computed in-network in order to reduce the number of message transmissions, latency, and power consumption comparing to the server-based approach, as discussed by Madden in cited sections. However, teachings of Madden do not alter the principle of operation of Mulgund since the aggregation of sensor readings is still performed as the end result and the Network Modeling Agent of Mulgund is still utilized in order to log the sensor readings from two different sets in the central database at the server device. Therefore, even if modified with teachings of Madden, Mulgund is still fit for its intended purpose, that is aggregating the state of an ad hoc network into a relational database (abstract of Mulgund). Thus, applicant's argument cannot be held as persuasive. It is further noted that applicant's argued "objective evidence" is clearly presented in the reasons for combination of Mulgund's and Madden's teachings in form of sections, paragraphs and page/line numbers in the cited references in support of the motivation to combine. Therefore, applicant's argument cannot be held as persuasive. In response to applicant's argument that *"were one to incorporate the aggregate of one or more mote-addressed content indexes as taught by Madden into the structure of Mulgund,*

Mulgund would no longer have a complete knowledge base 18" it is noted that applicants presented no evidence supporting the currently unsupported statement that Mulgund would no longer have a complete knowledge base 18. Thus, examiner disagrees and maintains that the combination of Mulgund's and Madden's teachings is proper and no change in the the principle of operation is made.

At point 7), applicant's arguments at pages 49-50 with respect to claim 31 have been fully considered but are moot in view of the new grounds of rejection. In particular, applicants canceled the rejected limitation "an output format of information from the queried device" necessitating new grounds of rejection.

Regarding remaining independent claims 13, 25, and 26, applicants presented analogous arguments as those already addressed with respect to claim 1.

As to any arguments not specifically addressed, they are the same as those discussed above or earlier presented in the previous response. Therefore, these arguments are not persuasive for analogous reasons.

Specification

4. The application contains disclosure entirely outside the bounds of the claims. Applicant is required to modify the brief summary of the invention and restrict the descriptive matter so as to be in harmony with the claims (MPEP § 1302.01).
In particular, it appears that only disclosure of section IV. TRANSMISSION OF AGGREGATED MOTE-ASSOCIATED INDEX DATA (pages 18-25 of the specification) is relevant to the subject matter of claims 1-42, as presently claimed. The rest of the specification describes the subject matter of the co-pending applications wherein the name

of each section in the specification corresponds to the name of each of the co-pending applications. Applicants are reminded that the subject matter of the earlier and later sections of the specification (sections I, II, III, and V.) is actually included through their incorporation by reference of the related/parent applications, as mentioned in the beginning of the specification (pages 1-4). As a result, providing a detailed description of the subject matter of co-pending applications is redundant and must be removed from the current application.

This objection was requested by applicants to be held in abeyance until allowable subject matter is indicated, pursuant to 37 CFR 1.111(b), in response dated November 26, 2008.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 5, 13-25, 30, 33-36 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, as the time the application was filed, had possession of the claimed invention.

As to claim 5, the claim recites *"the mote-addressed content indexes of the first set of motes comprises addresses of content stored in a memory in the first set of motes".* Examiner has reviewed applicant-cited portion of the specification and is unable to locate a

recitation of or a proper support for indexes comprising addresses of content stored in memory.

As to claim 13, the claim has been amended to recite "a device controlled by a second mote". Examiner has reviewed applicant-cited portion of the specification and is unable to locate a recitation of a device controlled by a second mote to transmit content index.

Claims 14-24 and 33-35 are rejected as being dependent from claim 13 and incorporating all the limitations of claim 13.

As to claim 25, the claim recites *"the transmitted aggregate of one or more mote-addressed content indexes of the first set of motes excluding mote-addressed content indexes of the second mote"*. Examiner has reviewed applicant-cited portion of the specification and is unable to locate a recitation of or a proper support for the transmitted aggregate excluding mote-addressed content indexes of the second mote.

Claims 30, 33, and 36 are rejected for analogous reasons as those discussed just above with respect to claim 25.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claims 1, 13, and 25, the claim recites a "second mote". It is unclear which mote is a "first mote" such that the second mote can be numerically identified as "second".

Dependent claims 2-12, 14-24, 30-35, and 39-42 are rejected as being dependent from corresponding independent claim and incorporating all the limitations of the rejected independent claim.

As to claim 4, it is unclear whether "reporting entity" is the same as "aggregator" of claim 1. It appears that claim 4 further defines the limitation of "transmitting to an aggregator" by reciting "transmitting to reporting entity" which suggests that reporting entity is the aggregator. Usage of inconsistent terminology when referring to same elements in the claim is ambiguous.

As to claims 14 and 15, it is unclear whether "means for transmitting" are the "device controlled by a second mote to transmit" of claim 13. The claim is ambiguous because it appears that there are two separate entities (a device and means for transmitting) that perform the same functionality of transmitting. Appropriate correction or explanation is required.

As to claims 14, 15, 18-21, and 23-25, these claims recite "means plus function" limitations that invoke 35 USC 112, sixth paragraph. However, the written description fails to disclose the corresponding structure, material, or acts for the claimed function. As an exemplary claim, claim 14 recites "means for transmitting at least a part of at least one of a mote-addressed sensing index or a mote-addressed control index". Examiner fails to locate any structure that would perform identified function. Claim 18 recites "means for effecting the transmitting". Examiner fails to locate a separate structure from that of "means for transmitting" recited in claim 14 that would perform identified function. The disclosure is also

silent with respect to internal structure of the means for effecting the transmitting as including additional means.

Applicant is required to:

(a) Amend the claims 14, 15, 18-21, and 23-25 so that the claim limitation will no longer be a means (or step) plus function limitation under 35 U.S.C. 112, sixth paragraph; or

(b) Amend the written description of the specification such that it expressly recites what structure, material, or acts perform the claimed function of claims 14, 15, 18-21, and 23-25 without introducing any new matter (35 U.S.C. 132(a)).

If applicant is of the opinion that the written description of the specification already implicitly or inherently discloses the corresponding structure, material, or acts so that one of ordinary skill in the art would recognize what structure, material, or acts perform the claimed function, applicant is required to clarify the record by either:

(a) Amending the written description of the specification such that it expressly recites the corresponding structure, material, or acts for performing the claimed function and clearly links or associates the structure, material, or acts to the claimed function, without introducing any new matter (35 U.S.C. 132(a)); or

(b) Stating on the record what the corresponding structure, material, or acts, which are implicitly or inherently set forth in the written description of the specification, perform the claimed function. For more information, see 37 CFR 1.75(d) and MPEP §§ 608.01(o) and 2181.

It is noted that a bare statement that known techniques or methods can be used would not be a sufficient disclosure. *See In re Donaldson Co.*, 16 F.3d 1189, 1195, 29

USPQ2d 1845, 1850 (Fed. Cir. 1994) (in banc); and *Biomedino, LLC v. Waters Technology Corp.*, 490 F.3d 946, 952, 83 USPQ2d 1118, 1123 (Fed. Cir. 2007).

A rejection under 35 U.S.C. 112, second paragraph, is appropriate if the written description of the specification discloses no corresponding algorithm. *See Aristocrat,* 521 F.3d at 1337-38, 86 USPQ2d at 1243. For example, merely referencing to a general purpose computer with appropriate programming without providing any detailed explanation of the appropriate programming *See Id.* at 1334, 86 USPQ2d at 1240, or simply reciting software without providing some detail about the means to accomplish the function *See Finisar*, 523 F.3d at 1340-41, 86 USPQ2d at 1623, would not be an adequate disclosure of the corresponding structure to satisfy the requirements of 35 U.S.C. 112, second paragraph, even when one of ordinary skill in the art is capable of writing the software to convert a general purpose computer to a special purpose computer to perform the claimed function.

To this extent, reference to a general purpose "electric circuitry" as made at pages 41-42 of the specification that mentions how *"those skilled in the art will recognize that the various aspects described herein which can be implemented, individually and/or collectively, by a wide range of hardware, software, firmware, or any combination thereof can be viewed as being composed of various types of "electrical circuitry""* fails to reasonably convey to one of ordinary skill in the art that the inventors, at the time the application was filed, had an adequate disclosure of the corresponding structure as containing electrical circuitry required to satisfy the requirements of 35 USC 112, second paragraph, even if one of ordinary skill in the art is capable of producing the special purpose electrical circuitry from the general purpose electrical circuitry to perform the claimed function.

As to claim 26, the limitation of "a multi-mote content index stored in a first set of motes" is ambiguous because it is unclear whether the index is stored in a particular single mote of the first set of motes or portions of the index are stored in various motes of the first set of motes such that the "index" as a whole is "stored in a first set of motes". Since the specification fails to describe the later case, it is assumed that the index is stored in a particular single mote of the first set of motes. However, the recitation of "stored in a first set of motes" is ambiguous as it fails to clearly identify which mote the index is stored in. Appropriate correction or explanation is required.

Dependent claims 27-29 and 36-38 are rejected as being dependent from and incorporating all the limitations of claim 26.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1, 3-10, 13, 15-22, 26-29, 32, 35, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. (US 2002/0161751 A1) in view of "TAG: a Tiny Aggregation Service for Ad-Hoc Sensor Networks" by Samuel Madden et al. and in further view of Ahmed (US 2004/0144849 A1).

As to claim 1, Mulgund teaches:

transmitting at least a part of one or more mote-addressed content indexes of a first set of motes [retrieving the sensor-related information stored at a node of a set of notes at

the left side of Fig. 1] (par. [0025] and [0062], wherein "node" and "mote" are interpreted to have the same meaning of small embedded platform that has one or more sensors; par. [0026]) administered by a first network administrator [administered by a first network access point/base station (Fig. 1) to an aggregator [database server 10] (Fig. 1) of (i) a first-set content index fro the first set of motes administered by the first network administrator [set of nodes at the left side of Fig. 1] and (ii) a second-set content index from a second set of motes administered by a second network administrator [set of nodes at the right side of Fig. 1 administered by a second network access point] (Fig. 1).

Mulgund does not expressly teach that transmitting is done with a second mote and that at least a part of an aggregate of one or more mote-addressed content indexes is transmitted (emphasis added). In Mulgund, aggregation is performed in the back-end of the network, i.e. at the server side.

Madden is directed to in-network aggregation of mote-addressed content indexes (abstract). Madden teaches transmitting with a second mote [child node] at least a part of an aggregate of one or more mote-addressed content indexes [sensor attributes, such as group id] of a first set of motes [a collection phase, where the aggregate value are continually routed up from children to parents] (abstract, section 1.1 par. 2, section 4, 4.1 pars. 1-2, and 4.2; Fig. 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by programming each node with a TinyOS of Madden and transmitting with a second mote at least a part of an aggregate of one of more mote-addressed content indexes in order to lower the number of message transmissions,

latency, and power consumption than the server-based approach (as taught by Mulgund) (Madden, section 4 under In-Network Aggregates).

Mulgund in view of Madden does not teach that differently administered motes are owned by different business entities.

Ahmed teaches motes [sensors] that provide different types of output signals being owned by different business entities [different manufacturers].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Madden by having motes owned by different manufacturers in order to allow for sensing different types of data by different motes, wherein different motes sense different types of information (Mulgund, par. [0026]).

As to claim 3, Mulgund in view of Madden teaches transmitting at least a part of a mote-addressed routing/spatial index (section 2.1, paragraphs 2 and 3, Madden).

As to claim 4, Mulgund in view of Madden teaches transmitting part of the aggregate of one or more mote-addressed content indexes of the first set of motes to a reporting entity [TinyOS, the mote operating system of the parent node receiving the transmitted aggregate] (section 1 Introduction, paragraph 1, Madden).

As to claim 5, Mulgund teaches that the mote-addressed content indexes of the first set of motes comprises addresses of content [attributes of the sensor data] stored in a memory in the first set of motes [knowledge base] (par. [0026] in Mulgund).

Mulgund does not teach transmitting with a second mote comprises obtaining access to the one or more mote-addressed content indexes of the first set of motes.

Madden teaches transmitting with a second mote comprises obtaining access to the one or more mote-addressed content indexes of the first set of motes [parent node obtaining a message from a child node, message containing one or more mote-addressed content indexes] (section 2.1, last paragraph, Madden)

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by transmitting with a second mote comprises obtaining access to the one or more mote-addressed content indexes of the first set of motes in order to lower the number of message transmissions, latency, and power consumption than the server-based approach (as taught by Mulgund) (Madden, section 4 under In-Network Aggregates).

As to claim 6, Mulgund in view of Madden teaches transmitting part of the aggregate of one or more mote-addressed content indexes of the first set of motes in response to a schedule (Madden, section 4.1, paragraphs 2 and 3).

As to claim 7, Mulgund in view of Madden teaches receiving the schedule (Madden, section 4.1, paragraphs 2 and 3).

As to claim 8, Mulgund in view of Madden teaches deriving the schedule (Madden, section 4.1, paragraphs 2 and 3).

As to claim 9, Mulgund in view of Madden teaches deriving the schedule at least in part from at least one of multiple optimized queries or multiple stored queries (Madden, section 4.1, paragraphs 2 and 3, wherein there are multiple queries posed, section 1.1 par. 2).

As to claim 10, Mulgund in view of Madden teaches transmitting part of the aggregate of one or more mote-addressed content indexes of the first set of motes in response to multiple queries (Madden, abstract, section 1.1 the TAG Approach).

As to claim 13, Mulgund teaches:

transmitting at least a part of one or more mote-addressed content indexes of a first set of motes [retrieving the sensor-related information stored at a node of a set of notes at the left side of Fig. 1] (par. [0025] and [0062], wherein "node" and "mote" are interpreted to have the same meaning of small embedded platform that has one or more sensors; par. [0026]) administered by a first network administrator [administered by a first network access point/base station (Fig. 1) to an aggregator [database server 10] (Fig. 1) of (i) a first-set content index fro the first set of motes administered by the first network administrator [set of nodes at the left side of Fig. 1] and (ii) a second-set content index from a second set of motes administered by a second network administrator [set of nodes at the right side of Fig. 1 administered by a second network access point] (Fig. 1).

Mulgund does not explicitly teach that transmitting is done with a device controlled by a second mote and that at least a part of an aggregate of one or more mote-addressed

content indexes is transmitted (emphasis added). In Mulgund, aggregation is performed in the back-end of the network, i.e. at the server side.

Madden is directed to in-network aggregation of mote-addressed content indexes (abstract). Madden teaches a device controlled by a second mote [child node's RFM radio device] to transmit at least a part of an aggregate of one or more mote-addressed content indexes [sensor attributes, such as group id] of a first set of motes [a collection phase, where the aggregate value are continually routed up from children to parents] (abstract, section 1.1 par. 2, section 4, 4.1 pars. 1-2, and 4.2; Fig. 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Mulgund by programming each node with a TinyOS of Madden and thus having a device controlled by a second mote to transmit at least a part of an aggregate of one of more mote-addressed content indexes in order to lower the number of message transmissions, latency, and power consumption than the server-based approach (as taught by Mulgund) (Madden, section 4 under In-Network Aggregates).

Mulgund in view of Madden does not teach that differently administered motes are owned by different business entities.

Ahmed teaches motes [sensors] that provide different types of output signals being owned by different business entities [different manufacturers].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Mulgund in view of Madden by having motes owned by different manufacturers in order to allow for sensing different types of data by different motes, wherein different motes sense different types of information (Mulgund, par. [0026]).

As to claims 15-22, Mulgund in view of Madden and Ahmed teaches all the elements, as discussed above with respect to corresponding method claims 3-10.

As to claim 26, Mulgund teaches at least one mote (Fig. 1 node (2)), and

transmitting at least a part of one or more mote-addressed content indexes of a first set of motes [retrieving the sensor-related information stored at a node of a set of notes at the left side of Fig. 1] (par. [0025] and [0062], wherein "node" and "mote" are interpreted to have the same meaning of small embedded platform that has one or more sensors; par. [0026]) administered by a first network administrator [administered by a first network access point/base station (Fig. 1) to an aggregator [database server 10] (Fig. 1) of (i) a first-set content index fro the first set of motes administered by the first network administrator [set of nodes at the left side of Fig. 1] and (ii) a second-set content index from a second set of motes administered by a second network administrator [set of nodes at the right side of Fig. 1 administered by a second network access point] (Fig. 1).

Mulgund does not explicitly teach at least one multi-mote reporting entity resident in said at least one mote, said at least one multi-mote reporting entity configured to report at least a part of a multi-mote content index stored in the first set of motes. In Mulgund, aggregation of separate indexes and creation of a "multi-mote index" is performed in the back-end of the network, i.e. at the server side.

Madden is directed to in-network aggregation of mote-addressed content indexes (abstract). Madden teaches at least one multi-mote reporting entity resident in said at least one mote, said at least one multi-mote reporting entity configured to report at least a part of a multi-mote content index stored in the first set of motes [a TinyOS that is installed on each

mote and that facilitates routing data from child device to a parent device] (section 1 Introduction).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Mulgund by programming each node with a TinyOS of Madden and thus having at least one multi-mote reporting entity resident in said at least one mote, said at least one multi-mote reporting entity configured to report at least a part of a multi-mote content index stored in motes other than the at least one mote in order to facilitate routing data between devices (Madden, section 1).

Mulgund in view of Madden does not teach that differently administered motes are owned by different business entities.

Ahmed teaches motes [sensors] that provide different types of output signals being owned by different business entities [different manufacturers].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Mulgund in view of Madden by having motes owned by different manufacturers in order to allow for sensing different types of data by different motes, wherein different motes sense different types of information (Mulgund, par. [0026]).

As to claim 27, Mulgund teaches that said multi-mote content index comprises at least one of a sensing function, a control function, or a routing/spatial information of a mote-appropriate device (paragraphs [0037], [0041] in Mulgund).

As to claim 28, Mulgund in view of Madden teaches said at least one multi-mote reporting entity [TinyOS] being configured to transmit at least one of a sensing function, a

control function, or a routing/spatial information [TinyOS uses a CSMA-like media access protocol to send and receive messages] (section 1 Introduction; section 2 par. 3 in Madden Ref. 1).

As to claim 29, Mulgund teaches at least one of a processor, a memory, or a communications devices formed from a substrate (par. [0026]).

As to claim 32, Mulgund teaches that the mote-addressed content index of the first set of motes includes data that indicates the availability of a light device, an electrical device entity, a pressure device entity, a temperature device entity, a volume device entity, an inertial device entity, or an antenna entity [each of Node Data Table is defined to accommodate the type of sensor data known to originate from that node] (par. [0042] in Mulgund).

As to claims 35 and 38, these claims are rejected under same rationale as claim 32, above.

11. Claims 2, 14, 31, 34, 37, and 39-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of "TAG: a Tiny Aggregation Service for Ad-Hoc Sensor Networks" by Samuel Madden et al (hereinafter *Madden TAG*) in view of Ahmed and in further view of "The Design of an Acquisitional Query Processor For Sensor Networks" by Samuel Madden et al. (hereinafter *Madden ACQP*).

As to claim 2, Mulgund in view of Madden TAG teaches all the elements except for sensing index being transmitted [sensors route data back towards the user through a routing tree rooted at the basestation] (section 1.1 paragraph 2, Madden Ref. 1).

Madden ACQP teaches at least one of a mote-addressed sensing index [a sensor table of sensors' readings and types of sensors] (section 3.1 Basic Language Features).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Madden TAG and Ahmed by transmitting at least a part of at least one of a mote-addressed sensing index in order to report sensor id, light, and temperature readings such that these readings make sense in a context of name-value pair (section 3.1 Basic Language Features, Madden ACQP) and (section 2 last paragraph, Madden TAG).

As to claim 14, Mulgund in view of Madden TAG, Ahmed and in further view of Madden ACQP teaches all the elements, as discussed per claim 2.

As to claim 31, Mulgund in view of Madden TAG, Ahmed, and Madden ACQP teaches that the mote-addressed sensing index or the mote-addressed control index indicates a format of information obtained from the sensing device [readings are presented in a context of name-value pairs] (section 3.1 Basic Language Features, Madden ACQP) and (section 2 last paragraph, Madden TAG).

As to claims 34 and 37, these claims are rejected under same rationale as claim 31, above.

As to claims 39 and 40, Mulgund teaches transmitting output format data indicating an output format of information of the sensing device [each of Node Data Table is defined to accommodate the type of sensor data known to originate from that node] (par. [0042] in Mulgund).

Madden teaches that each sensor has a copy of TinyOS installed (Madden TAG section 1). Therefore, a query command format data is inherently transmitted with every query and response since the devices operate using the same OS and query model (Madden TAG, section 3.1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by transmitting query data indicating a query command format of a sensing device in order to allow the device posing the query to send the query that the sensing device would understand and be able to respond to (Madden TAG, section 3.1).

As to claims 41 and 42, Mulgund teaches transmitting feedback format data indicating a feedback format of information of the sensing device [each of Node Data Table is defined to accommodate the type of sensor data known to originate from that node] (par. [0042] in Mulgund).

Madden teaches that each sensor has a copy of TinyOS installed (Madden TAG section 1). Therefore, a control command format data is inherently transmitted with every query and response since the devices operate using the same OS and query model (Madden TAG, section 3.1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by transmitting control command format data indicating a control command format of a sensing device in order to allow the device posing the query to send the query that the sensing device would understand and be able to respond to (Madden TAG, section 3.1).

12. Claims 11, 12, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of "TAG: a Tiny Aggregation Service for Ad-Hoc Sensor Networks" by Samuel Madden et al. in view of Ahmed and in further view of Regli et al. (US 2005/0141706 A1).

As to claim 11, Mulgund in view of Madden and Ahmed teaches all the elements except for encrypting part of the aggregate of one or more mote-addressed content indexes of the first set of motes utilizing at least one of a private or a public key.

Regli teaches encrypting part of the aggregate of one or more mote-addressed content indexes of the first set of motes utilizing at least one of a private or a public key (par. [0056]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Madden and Ahmed by encrypting part of the aggregate of one or more mote-addressed content indexes of the first set of motes utilizing at least one of a private or a public key in order to support encrypted communication at the network layer between wireless devices (paragraphs [0054]-[0056] in Regli).

As to claim 12, Mulgund in view of Madden and Ahmed teaches all the elements except for decoding at least a part of one or more mote-addressed content indexes utilizing at least one of a public key or a private key.

Regli teaches decoding traffic on the network layer [decryption of traffic] utilizing at least one of a public key or a private key (paragraph [0064]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Madden and Ahmed by having at least a part of one or more mote-addressed content indexes (as taught by Mulgund in view of Madden) being decoded utilizing at least one of a public key or a private key (as taught by Regli) in order to support encrypted communication at the network layer between wireless devices (paragraphs [0054]-[0056] and [0064] in Regli).

As to claims 23 and 24, Mulgund in view of Madden, Ahmed, and in further view of Regli teaches all the elements, as discussed per claim 11 and claim 12 above.

13. Claims 25, 30, 33, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of "TAG: a Tiny Aggregation Service for Ad-Hoc Sensor Networks" by Samuel Madden et al. in view of Ahmed and in further view of "A Transmission Control Scheme for Media Access in Sensor Networks" by Alec Woo et al.

As to claim 25, Mulgund teaches a second mote (Fig. 1 node (2)) and

transmitting at least a part of one or more mote-addressed content indexes of a first set of motes [retrieving the sensor-related information stored at a node of a set of notes at the left side of Fig. 1] (par. [0025] and [0062], wherein "node" and "mote" are interpreted to

have the same meaning of small embedded platform that has one or more sensors; par. [0026]) administered by a first network administrator [administered by a first network access point/base station (Fig. 1) to an aggregator [database server 10] (Fig. 1) of (i) a first-set content index fro the first set of motes administered by the first network administrator [set of nodes at the left side of Fig. 1] and (ii) a second-set content index from a second set of motes administered by a second network administrator [set of nodes at the right side of Fig. 1 administered by a second network access point] (Fig. 1).

Mulgund does not explicitly teach means for transmitting at least a part of an aggregate of one or more mote-addressed content indexes of a first set of motes, the transmitted aggregate of one or more mote-addressed content indexes of the first set of motes excluding mote-addressed content indexes of the second mote, and said means for transmitting being disposed proximate to said second mote.

Madden is directed to in-network aggregation of mote-addressed content indexes (abstract). Madden teaches means for transmitting at least a part of an aggregate of one or more mote-addressed content indexes of a first set of motes, and said means for transmitting being disposed proximate to said mote [a TinyOS that facilitates routing data from child device to a parent device] (section 1 Introduction).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Mulgund by programming each node with a TinyOS of Madden and thus having means for transmitting at least a part of an aggregate of one or more mote-addressed content indexes of a first set of motes, and said means for transmitting being disposed proximate to said mote in order to facilitate routing data between devices (Madden, section 1).

Mulgund in view of Madden does not teach that differently administered motes are owned by different business entities.

Ahmed teaches motes [sensors] that provide different types of output signals being owned by different business entities [different manufacturers].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Mulgund in view of Madden by having motes owned by different manufacturers in order to allow for sensing different types of data by different motes, wherein different motes sense different types of information (Mulgund, par. [0026]).

Mulgund in view of Madden and Ahmed does not teach that the transmitted aggregate of one or more mote-addressed content indexes of the first set of motes excludes mote-addressed content indexes of the second mote.

Woo shows a complete TinyOS application component graph wherein the sensor component periodically transmits the data toward a base station over the multihop network (section 2.1 Networking Component Stack). In particular, Woo teaches that the transmitted data of the first set of motes excludes data of the second mote [multihop component receives a packet and retransmits it to the upstream level] (section 2.1 Networking Component Stack, par. 2).

It would have been obvious to one of ordinary skill in the art at the time of the rejection to modify the system of Mulgund in view of Madden and Ahmed by having the transmitted aggregate of one or more mote-addressed content indexes of the first set of motes exclude mote-addressed content indexes of the second mote in order to perform pure retransmission of received packets along the network without performing additional

functionality of aggregating, such pure retransmission conserving power from being used for data aggregation in each mote.

As to claim 30, Mulgund in view of Madden and Ahmed does not teach that the transmitted aggregate of one or more mote-addressed content indexes of the first set of motes excludes mote-addressed content indexes of the second mote.

Woo shows a complete TinyOS application component graph wherein the sensor component periodically transmits the data toward a base station over the multihop network (section 2.1 Networking Component Stack). In particular, Woo teaches that the transmitted data of the first set of motes excludes data of the second mote [multihop component receives a packet and retransmits it to the upstream level] (section 2.1 Networking Component Stack, par. 2).

It would have been obvious to one of ordinary skill in the art at the time of the rejection to modify the method and/or system of Mulgund in view of Madden and Ahmed by having the transmitted aggregate of one or more mote-addressed content indexes of the first set of motes exclude mote-addressed content indexes of the second mote in order to perform pure retransmission of received packets along the network without performing additional functionality of aggregating, such pure retransmission conserving power from being used for data aggregation in each mote.

Claim 33 is rejected under the same rationale as claim 30, above.

As to claim 36, Mulgund in view of Madden and Ahmed does not teach that the at least one multi-mote reporting entity is configured to report at least a part of a multi-mote content index stored in motes without reporting a content index stored in the at least one mote.

Woo shows a complete TinyOS application component graph wherein the sensor component periodically transmits the data toward a base station over the multihop network (section 2.1 Networking Component Stack). In particular, Woo teaches that the at least one multi-mote reporting entity is configured to report data stored in motes without reporting data stored in the at least one mote [multihop component receives a packet and retransmits it to the upstream level] (section 2.1 Networking Component Stack, par. 2).

It would have been obvious to one of ordinary skill in the art at the time of the rejection to modify the system of Mulgund in view of Madden and Ahmed by having the at least one multi-mote reporting entity being configured to report at least a part of a multi-mote content index stored in motes without reporting a content index stored in the at least one mote in order to perform pure retransmission of received packets along the network without performing additional functionality of aggregating, such pure retransmission conserving power from being used for data aggregation in each mote.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to OLEG SURVILLO whose telephone number is (571)272-9691. The examiner can normally be reached on M-Th 9:30am - 7:00pm; F 10:00am - 6:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Asad Nawaz can be reached on 571-272-3988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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